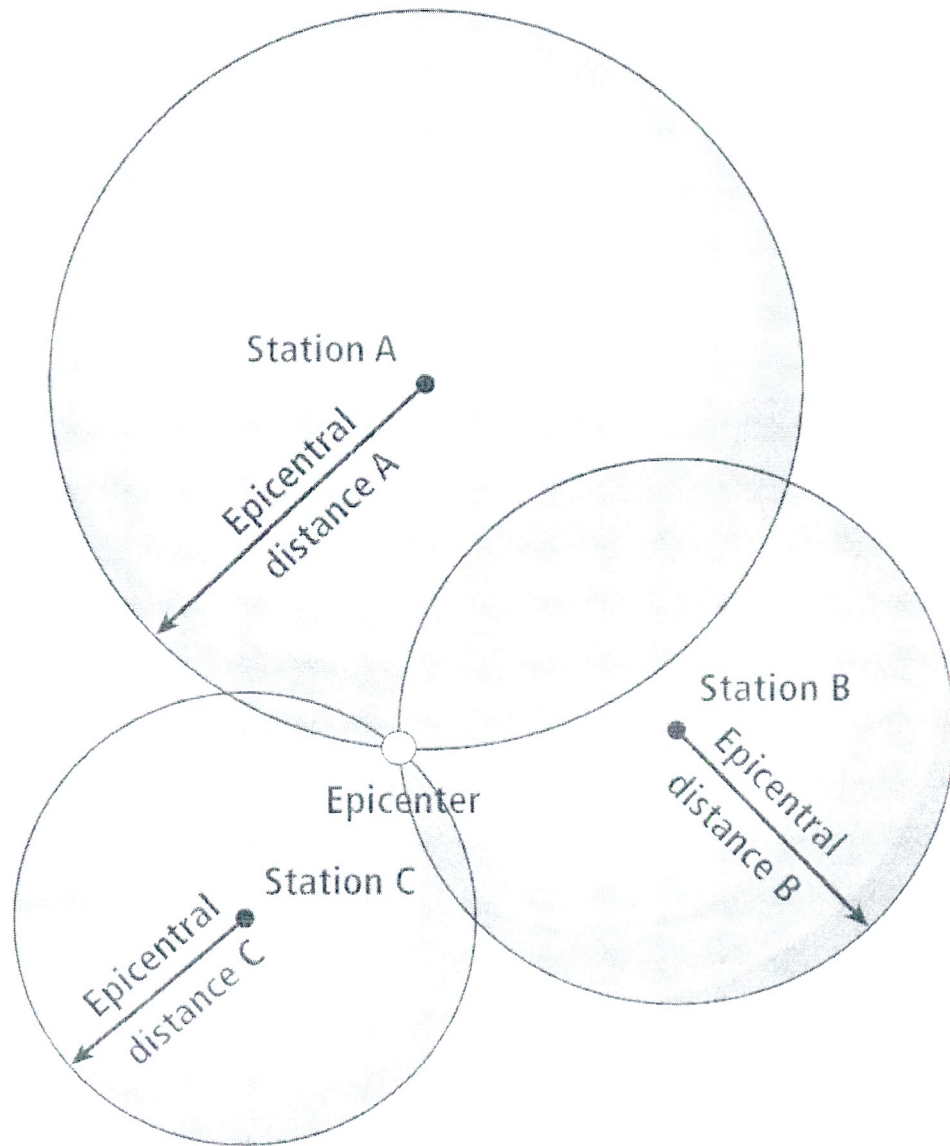


Locating Earthquakes



Locating Earthquakes

1. What is an earthquake's epicenter?

2. What does each circle in the diagram represent?

3. What is an epicentral distance?

4. How is an epicentral distance determined?

5. How many epicentral distances must be determined to locate an earthquake's epicenter?

6. How many possible locations of an epicenter can be determined from two epicentral distances? Explain your answer.

SECTION 2

Enrichment

Determining the Time of an Earthquake

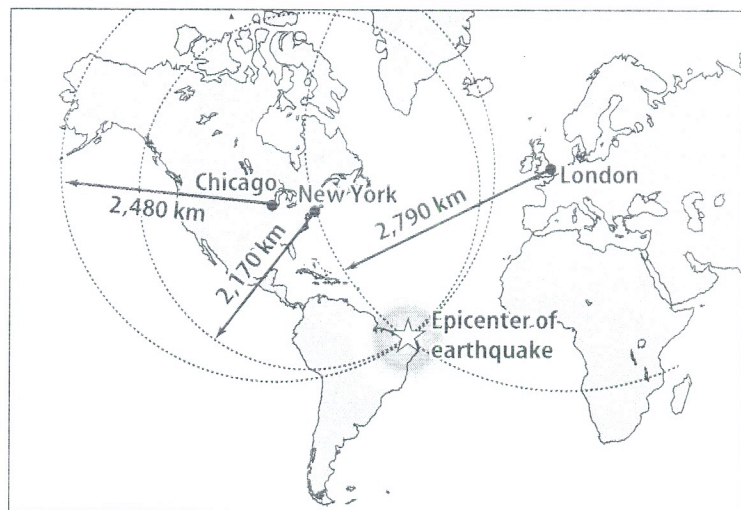
Directions: Read the information and study the table giving travel times of seismic waves from an earthquake. Then study the map identifying the epicenter of the earthquake to answer the questions below.

Distance from epicenter (km)	Travel Time					
	Primary waves		Secondary waves		Surface waves	
	min	s	min	s	min	s
620	3	20	6	0	7	20
1,240	5	56	10	48	14	16
1,860	8	00	14	30	21	30
2,480	9	50	17	50	27	50
3,100	11	26	20	51	35	56
3,720	12	43	23	27	41	43

Seismologists use the distance from an epicenter plus the times of the arrival of primary, secondary, and surface waves to determine the time an earthquake begins.

1. On what continent did the earthquake occur?

2. How far was the earthquake from London? New York? Chicago?



3. How long did it take the primary waves to reach Chicago?

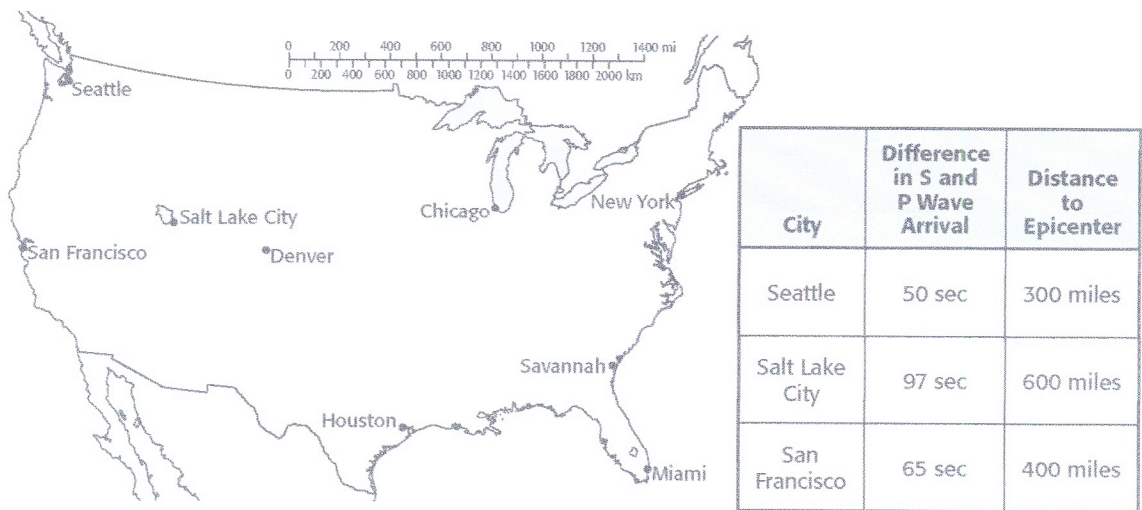
4. The primary waves reached Chicago at 9:00 A.M. When did the earthquake occur in Chicago time? What math operation did you use to determine the time of the earthquake?

5. The earthquake epicenter was located two time zones east of Chicago. What time was it in the time zone containing the epicenter when the earthquake began? _____

Name _____ Date _____

Locating the Epicenter of an Earthquake

The point beneath the Earth's surface where an earthquake occurs is the focus. The point on the Earth's surface above the focus is called the epicenter. Use the map and the data table to answer these questions.



1. An earthquake produces different types of waves. One type is known as a P-wave and the other is known as the S-wave. Using the difference between the arrivals of the P- and S-waves indicate the distance to the earthquake epicenter. Look at the table above. What is the relationship between the different arrivals of the P- and S-waves and the distance to the epicenter? _____
2. Use the scale on the map to help you set a compass. The map scale tells you the number of miles equal to one inch on the map. The distance from Seattle to the epicenter is _____ miles. Using the map scale, how far is this in inches? _____

Draw a circle around Seattle with your compass. Repeat this for the other two cities.

3. Find the point where the three circles overlap. Mark that spot with an X. Which city is closest to the epicenter? _____
4. Look at the map. Which city detected the wave first? _____ Which city detected it last? _____